

101  
Total  
Points

Name:

Mr. Davis

Solution Key

(4) 1. Graph the line with equation  $y = 2x - 5$

(2) What is the slope of the line?

$$m = 2$$

(2) What are the coordinates of the y-intercept?

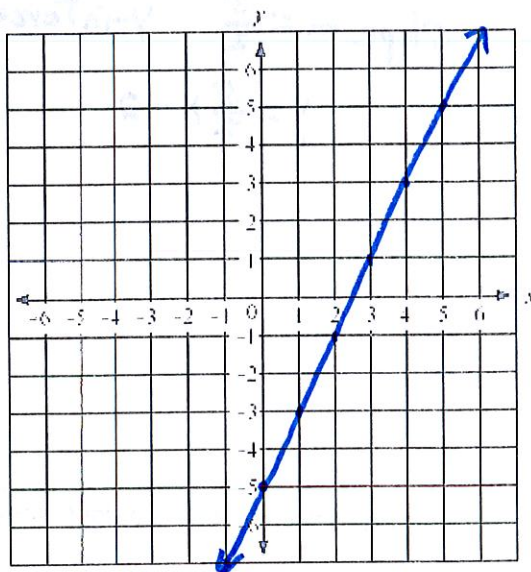
$$(0, -5)$$

(2) What are the coordinates of the x-intercept?

an x-intercept has a  $y = 0$

$$0 = 2x - 5 \quad 5 = 2x \quad \frac{5}{2} = x \quad x = 2\frac{1}{2}$$

$$(2\frac{1}{2}, 0)$$



2. A line contains two points  $P(-1, 10)$  and  $T(4, -5)$ .

(4) a. Determine an equation of the line in slope intercept form.

$$m = \frac{10 - (-5)}{-1 - 4} = \frac{10 + 5}{-5} = \frac{15}{-5} = -3 \quad y = -3x + b$$

Pick one point  $P(-1, 10) \quad 10 = -3(-1) + b \quad 10 = 3 + b \quad 7 = b$

$$y = -3x + 7$$

(2) b. What is the y-coordinate at the point where the x-coordinate is  $x = -20$ ?

$$y = -3(-20) + 7 = 60 + 7 = 67$$

$$y = 67 \text{ when } x = -20$$

(4) 3. Solve the literal equation  $C = Ax + By$  for  $A$

$$C = Ax + By$$

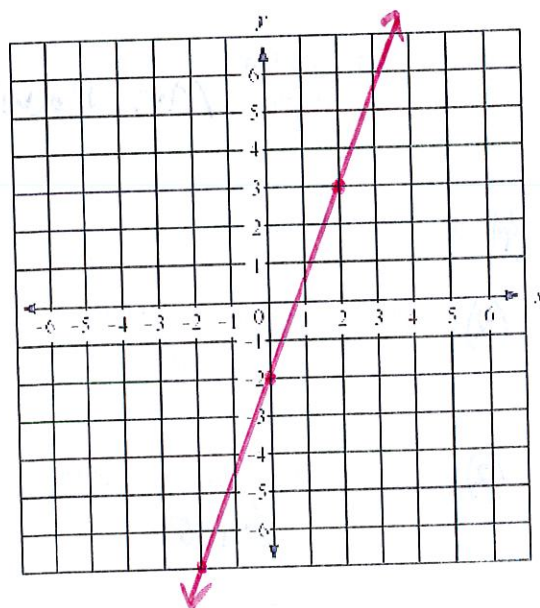
$$C - By = Ax$$

$$\frac{C - By}{x} = A$$

- (4) 4. Write an equation of the line shown in slope-intercept form.

slope  $m = \frac{5}{2}$  y-intercept  $b = -2$

$$y = \frac{5}{2}x - 2$$



5. Convert each equation from slope-intercept form to standard form or vice versa:

(4)

a.  $6x - y = -5$

$$-y = -6x - 5$$

$$y = 6x + 5$$

(4)

b.  $y = \frac{-2}{3}x + 4$

$$3y = -2x + 12$$

$$2x + 3y = 12$$

(2)

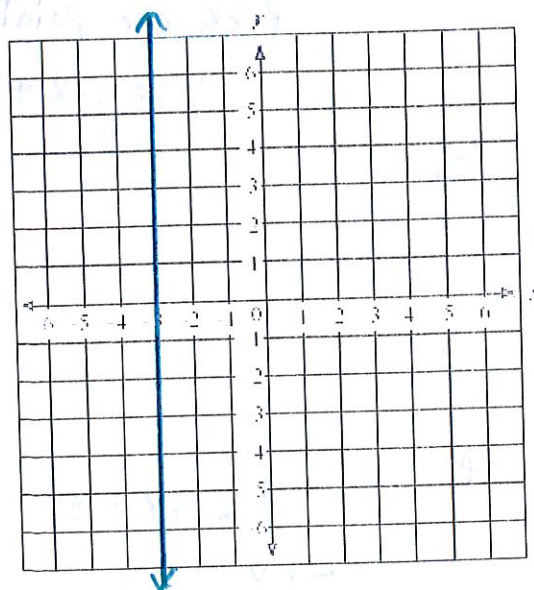
6. Write an equation of the line shown

$$x = -3$$

(2)

- What is the slope of the line?

slope is undefined



- (3) 7. Find an equation of the line with slope  $m = \frac{3}{5}$  and point  $A(0, -2)$  y-intercept because the x-value is zero  
 $b = -2$
- $y = \frac{3}{5}x + b$        $y = \frac{3}{5}x - 2$

8. Kayla gets in her cab and notices the initial up-front fee on the meter. After 2 minutes, the meter reads \$6.50, and after 6 minutes, the meter reads \$12.50.

- (2) a. What is the rate of change in this scenario? Include the proper units.  $(x, y) = (\text{min}, \text{dollars})$   
 $(2, 6.50) \text{ \& } (6, 12.50)$

$$m = \frac{12.50 - 6.50}{6 - 2} = \frac{6}{4} = \frac{3}{2} = \$3 \text{ per } 2 \text{ min} = \$1.50 \text{ per min}$$

- (3) b. What is an equation or rule or formula that gives the cab fare as a function of time?

The 0<sup>th</sup> term or y-intercept is 3.50

$$y = 1.5x + 3.50$$

- (2) c. How much will a 20-minute cab ride cost?

$$x = 20 \quad y = 1.5(20) + 3.50 = 30 + 3.50 = \$33.50$$

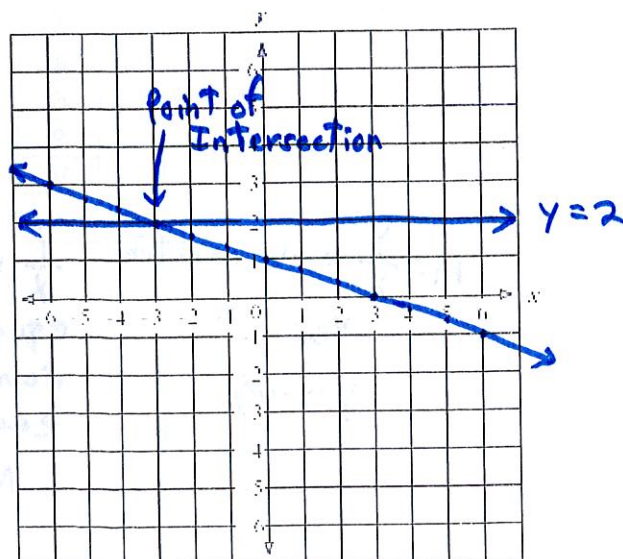
- (6) 9. Solve the literal equation  $\frac{x^2 + gh}{y} = k$  for  $g$ .

$$\frac{x^2 + gh}{y} = k \quad x^2 + gh = yk \quad gh = yk - x^2 \quad g = \frac{yk - x^2}{h}$$

- (6) 10. Solve the system of two equations by graphing. State the coordinates of the intersection point.

$$y = 2 \quad \& \quad y = -\frac{1}{3}x + 1$$

$(-3, 2)$  is the solution





- (4) 11. Determine an equation of the line that contains the point  $P(-4, 5)$  and is parallel to the line with equation  $-3x + 2y = -8$ .

$$-3x + 2y = -8 \quad 2y = 3x - 8 \quad y = \frac{3}{2}x - 4 \quad m = \frac{3}{2}$$

Parallel Line  $y = \frac{3}{2}x + b$   $5 = \frac{3}{2}(-4) + b$   $5 = -6 + b$   $11 = b$

Equation is  $y = \frac{3}{2}x + 11$

- (4) 12. Determine an equation of the line that contains the point  $P(2, -1)$  and is perpendicular to the line shown.

The given line has slope  $\frac{2}{3}$

A perpendicular line will have slope  $-\frac{3}{2}$

$$y = -\frac{3}{2}x + b$$

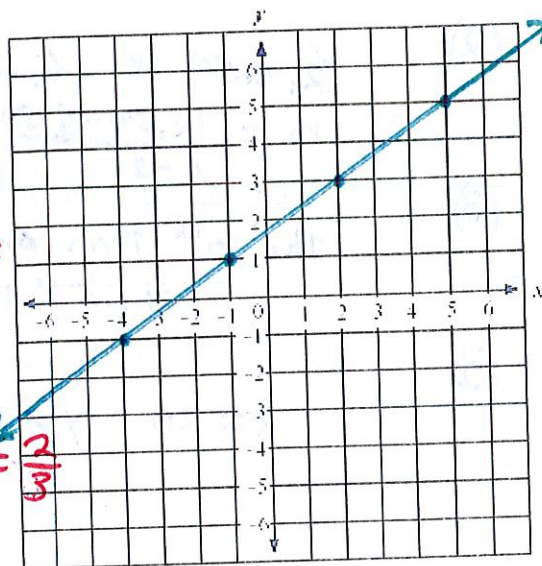
Use  $(2, -1)$  to find  $b$ .  $m = \frac{2}{3}$

$$-1 = -\frac{3}{2}(2) + b$$

$$-1 = -3 + b$$

$$2 = b$$

$$y = -\frac{3}{2}x + 2 \text{ Answer}$$



13. Determine which tables contain data representing a proportional relationship. Write "yes" or "no" below each table. If "yes", write an equation representing the proportional relationship.

(4)

x	y
-3	12
-1	4
0	0
2	-8
4	-16

$$m = \frac{y}{x} = -4 \text{ each time}$$

Yes

$$y = -4x$$

(2)

X	y
2	3
4	7
6	11
9	17
10	19

$\frac{y}{x}$  is not equal to the same # each time

NO

(2)

x	y
0	0
1	1
2	4
3	9
4	16

NO

(4)

x	y
-3	-2
3	2
6	4
9	6
12	8

$$m = \frac{y}{x} = \frac{2}{3} \text{ each time}$$

Yes

$$y = \frac{2}{3}x$$

- (4) 14. Write a rule or equation or formula for the linear sequence  $-14, -6, 2, 10, 18, \dots$

common difference  $d = -6 - (-14) = -6 + 14 = 8$   $m = 8$   
 $d = 2 - (-6) = 2 + 6 = 8$   
 etc...

The zeroth term is  $-14 - 8 = -22$

$$y = 8x - 22$$

15. A water pump can remove water from a pool at a constant rate. 75 gallons are removed in 5 minutes and 165 gallons are removed in 11 minutes.

- (2) a. What is the rate in gallons per minute at which the water is being pumped out of the pool?

(min, gall) = (x, y) (5, 75) & (11, 165)

$$m = \frac{165 - 75}{11 - 5} = \frac{90}{6} = 15 \text{ gallons per minute}$$

- (2) b. Write a rule or equation or formula that represents the amount of water being pumped out as a function of time.

There is no 0th term or y-intercept

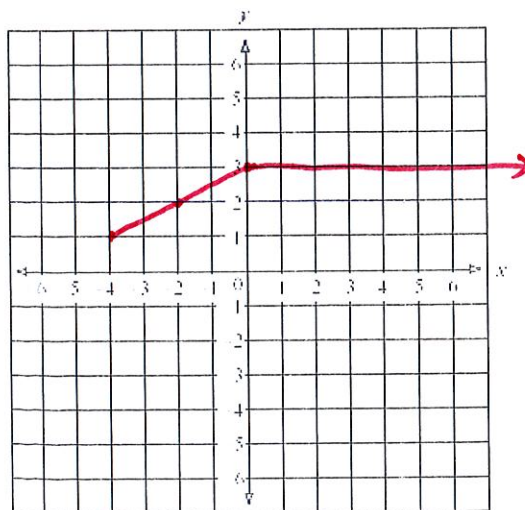
$y = 15x$  This is a proportional relationship linear function

- (2) c. How many gallons are pumped out after one hour?

1 hour = 60 min  $x = 60$   $y = 15(60) = 900$  gallons

- (4) 16. Draw a graph of the piecewise function defined by

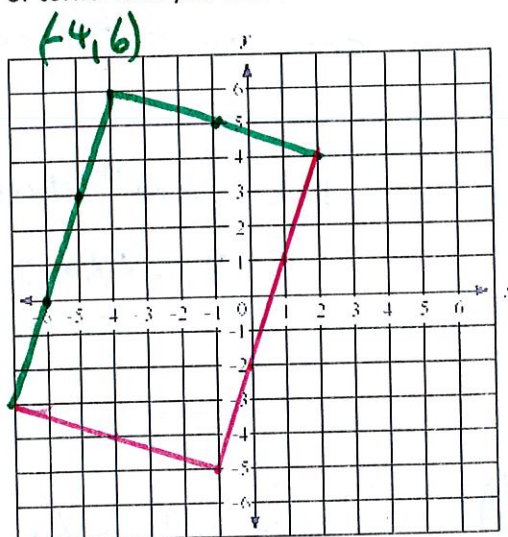
$$f(x) = \begin{cases} \frac{1}{2}x + 3 & \text{if } [-4, 0) \\ 3 & \text{if } [0, \infty) \end{cases}$$



(3)

17. Carefully finish drawing the rectangle using slopes and given the information displayed in the graph shown. Write the coordinates of the fourth vertex or corner that you found.

The fourth vertex  $(-4, 6)$



(6)

18. Solve the system of two equations by graphing.

$$x + y = 0 \quad \& \quad y - \frac{4}{3}x = 6$$

$$y = -x \quad y = \frac{4}{3}x + 6$$

Estimated intersection

The solution is  $(-2.5, 2.5)$

